Index

Page

Advantages of group plan of foundry cost accounting..... 42
Air used in producing pig iron in blast furnaces.....333, 336
Allis-Chalmers company apprentice training..... 61
Aluminum bronze, Heat treatment of..... 455
Aluminum bronze as an engineering material..... 449
Aluminum copper alloy..... 449
Analysis of cast iron chaplets..... 262
Annealing, Definition of..... 225
Annealing to reduce hardness in chromium cast iron..... 361
Application of heat resistant cast iron..... 362
Apprentice promotion of Chicago Branch of National Metal Trades Association 57
Apprentice training, Allis-Chalmers Company..... 61
Apprentice training, Discussion on..... 84
Apprentice training, Report of Committee..... 6
Apprentice training and vocational guidance..... 58
Apprentice training at Harvey, Illinois..... 89
Apprentice training campaign in Milwaukee, Metal Trades Association 66
Apprentice training in Quad Cities of Illinois and Iowa..... 75
Apprentice training, Plan of Bay City foundrymen..... 52
Apprentice training, Plan of Bucyrus Company..... 46
Apprentice training situation in the Pittsburgh District..... 71
Apprenticeship, Cooperation first essential towards success in..... 75
Apprenticeship as a labor stabilizer..... 45
Apprenticeship to attract young men, A publicity program justified by correct methods of..... 56
Apprentice turnover, Careful selection and supervision are important in reducing..... 61
Apprentices, Upgrading of foundry..... 79
Apprenticeship pay dividends, Making..... 51

Blacking, Foundry..... 235
Blackings by pneumatic agitator, Mixing of wet..... 242
Blast furnace, Air used in producing pig iron from.....333, 336
Blast furnace, Use of iron scrap in the.....319, 323, 328
Blast furnace, Steel scrap in the..... 320
Blast furnace conditions in making pig iron..... 428
Blast furnace on pig iron, Resolution to provide for investigation of effect of use of scrap in..... 348
Borings and turnings in cupola, Melting..... 331

Page
Brass and bronze fluidity tests..... 303
Brass castings, Reduction of molding losses of..... 458
Bronze, Heat treatment of aluminum..... 455
Bronze and brass fluidity tests..... 303
Bronze as an engineering material, Aluminum..... 449
Bucyrus Company apprentice training plan..... 46
Bungs for malleable furnaces, Shapes of..... 442
Bureau of standard soil corrosion investigation..... 101

Carbon and chromium effects on cast iron..... 360
Carbon in cast iron, Chromium and..... 365
Cast irons, Annealing to reduce hardness in chromium..... 361
Cast iron, Application of heat resistant..... 362
Cast iron, Carbon and chromium effects on..... 360
Cast iron, Chromium and carbon in..... 365
Cast iron, Chromium and machinability of..... 365
Cast iron, Chromium and silicon in.....364, 366
Cast iron, Chromium and strength properties of..... 363
Cast iron, Conclusions of causes of growth of..... 317
Cast iron, Diefenthaler process of making pearlitic..... 408
Cast iron, Dilatometric test results on growth of..... 308
Cast iron, Effects of Chromium and nickel in..... 356
Cast iron, Effects of silicon on growth of..... 310
Cast iron, Fatigue tests of..... 410
Cast iron, Growth of 307
Cast iron, Metalloids in 320
Cast iron, Oxidation of iron preceded by oxidation of graphite causing growth in..... 310
Cast iron, Review of research work on growth under repeated heatings and coolings of..... 307
Cast iron, Some graphite formations in gray..... 386
Cast iron, Summation of some investigations on effect of chromium in 357
Cast iron, Test bars to establish fluidity of..... 289
Cast iron, What is fluidity in..... 289
Cast iron, Chaplets of..... 260
Cast iron, chaplets, Analysis of..... 262
Cast iron, Corrosion in buried specimens of..... 119
Cast iron fluidity, Early investigations of..... 290
Cast iron growth on heating to temperature below 700 degrees centigrade 315
Cast iron of nickel and chromium, Effects on..... 370
Cast iron on corrosion resistance, Effects of chromium in..... 358
Cast iron on repeated heatings, Chromium influence on resistance to growth of 369
Cast iron pipe, Corrosion of..... 101
Cast iron specimens for macrographic examination, Care in preparing 386

Page
Castings, Chemical analysis and defective..... 254
Cementite in cast iron..... 388
Chaplets, Analysis of cast iron..... 262
Chaplets, Cast iron 260
Chaplets and core irons, Molds to test cast iron..... 258
Chaplets and tinned and untinned core irons, Cast..... 256
Charcoal iron 349
Charpy notched-bar tests of fatigue in cast iron..... 420
Chemical analysis and defective castings..... 254
Chemical tests for core oil qualities..... 150
Chemical versus fracture grading of foundry pig-irons..... 325
Chromium, Effects on cast iron of nickel and..... 370
Chromium and carbon in cast iron..... 365
Chromium and machinability of cast iron..... 365
Chromium and nickel in cast iron, Effects of..... 356
Chromium and silicon in cast iron.....364, 366
Chromium and strength properties of cast iron..... 363
Chromium cast irons, Annealing to reduce hardness in..... 361
Chromium effects on cast iron, Carbon and..... 360
Chromium in cast iron on corrosion resistance, Effects of..... 358
Chromium in cast iron, Summation of some investigations on effect of 357
Chromium influence on resistance to growth of cast iron on repeated heatings 369
Chromium to cupola mixtures, Making additions of..... 372
Chromium to iron mixtures, Adding..... 371
Clay content classification of foundry sands..... 195
Clay content classification of foundry sands, Calculations showing... 196
Clay important in making synthetic molding sand, Selection of proper 141
Clay quality on molding sand, Effects of..... 191
Colloids in molding sand..... 191
Committee reports presented at annual business meeting, Technical.. 1
Copper-aluminum alloy 449
Core binders, Characteristics of materials for..... 158
Core boxes and patterns, Marking loose pieces for..... 97
Core irons, Molds to test chaplets and..... 258
Core oil qualities, Chemical tests of..... 150
Core oil specifications..... 148
Core prints for metal patterns, Standard sizes of..... 98
Core sand materials, Characteristics of some steel molding and..... 202
Core sand mixtures, Temperatures for baking..... 159
Core sand tests, Testing equipment for..... 161
Core sands for molding sand purposes, Treating..... 140
Core testing, Report of sub-committee on..... 179
Cores, The effects of moisture absorption on the properties of dry sand 158
Cores for steel molding..... 212

Page
Corrosion of buried specimens of cast iron..... 189
Corrosion of iron pipe..... 101
Corrosion of metals, Report of committee on..... 5
Corrosion resistance, Effects of chromium in cast iron on..... 358
Cost accounting, Analysis of group plan of foundry..... 42
Cost accounting, Seven years of..... 32
Cost accounts, Divisions of..... 39
Cost figures of steel molding materials..... 207
Cost system for a local cost group, Uniform..... 20
Costs, Foundry 18
Costs, Group foundry..... 38
Costs, Malleable foundry..... 18
Costs, Overhead foundry..... 22
Costs, Report of committee on foundry..... 10
Costs, Steel foundry..... 18
Cupola, Effects of booster charge of coke in..... 282
Cupola, Hand charged..... 279
Cupola, Melting borings and turnings in a..... 331
Cupola, Results of low coke bed in a..... 281
Cupola iron temperature charts..... 276
Cupola lining refractories..... 266
Cupola mixtures, Making additions of chromium to..... 372
Cupola operation by means of cupola temperature recorder, Correction of 275
Cupola operation responsibility limited in causing defective castings. 253
Cupola refractories, Slag corrosion of..... 270
Cupola refractories, Spalling of 268
Cupola spout arranged for iron temperature recorder..... 276
Cupolas, Causes of irregular temperatures of iron from..... 277

Defective castings, Analysis of four hundred tons of..... 247
Dendritic striations in cast iron..... 397
Description of electrical testing machine to determine qualities of graphite and amorphous carbon blackings..... 240
Diefenthaler process of making pearlitic cast iron..... 408
Dilatometric test results of Kikuta on growth of cast iron..... 308
Divisions of cost accounts..... 39
Door opening tile for malleable furnaces..... 438

Effects of moisture in sand on fluidity of iron..... 294
Effect of ramming molding sand permeability specimens to upper, middle and lower limits of specimen lengths..... 185
Effects on molds and castings using steam heat for drying molds.... 220
Electrical method of testing foundry blackings..... 237
Eutectic, proeutectic and massive cementites in cast iron..... 393

Page
Ferrochrome, Melting point of ... 374
Fillet sizes for steel, malleable iron and non-ferrous castings ... 97
Fineness number of foundry sands, Calculations showing grain ... 196
Fatigue of cast iron, Test specimens and methods of testing for ... 417
Fatigue tests of cast iron ... 410
Fatigue tests of cast iron, S-N diagrams for ... 423
Fluidity, What is cast iron ... 289
Foundry blacking ... 235
Foundry costs ... 18
Foundry costs group ... 38
Foundry sand, Moisture test of ... 181
Foundry sand, Refractoriness test of ... 181
Foundry sand, Report of committee on tests of ... 179
Foundry sands, Colloids in ... 191
Foundry sands, Example showing calculations to obtain grain fineness number, grain fineness classification and clay content classification of ... 196
Foundry sands, Report of committee on grading ... 187
Foundry sands, Report of sub-committee on conservation and reclamation of ... 198
Foundry sands, Tentative standard grading classification for ... 193
Fracture grading of foundry pig irons, Chemical versus ... 325
Fusion, Penetration and vitrification of materials in steel molding ... 211

Glycerine to prevent molding sand drying out too quickly, Use of ... 141
Grading foundry sands, Report of committee on ... 187
Grain distribution effect on molding sand quality ... 188
Grain fineness, Method for calculating ... 190
Grain fineness classification of foundry sands ... 195
Grain fineness number of foundry sands ... 194
Grain fineness number of foundry sands, Calculations showing ... 196
Grain shape of molding sand ... 190
Graphite blackings, Test of ... 236
Graphite causing growth in cast iron, Oxidation of iron preceding oxidation of ... 310
Graphite formations in gray cast iron, Some ... 386
Graphite in cast iron, Distribution of ... 390
Graphite in cast iron, Hypereutectic formation of ... 397
Graphite in cast iron, Rosette or whorl formation of ... 397
Graphitizing, Definition of ... 226
Gray iron castings, Report of committee on ... 11
Gray cast iron, Some graphite formation in ... 386
Green and dry bond properties of steel molding materials ... 206
Group foundry costs ... 38
Growth of cast iron ... 307
Growth of cast iron, Conclusion on causes of ... 317

Page
Growth of cast iron, Dilatometric test results on..... 308
Growth of cast iron, Review of research work on..... 307
Growth of cast iron on repeated heatings, Chromium influence on resistance to 369

Heat treating terms, Definitions of..... 225
Heat treatment of aluminum bronze..... 455
Heat treatment of ferrous metals, Report of committee on..... 13
High temperature materials for steel molding and core making..... 209

International test bar for iron tests..... 13
Iron, Charcoal 349
Iron, Effects of silicon on growth of cast..... 310
Iron, Fatigue tests of cast..... 410
Iron, Growth of cast..... 315
Iron, Metalloids in cast..... 320
Iron, Some graphite formations in gray cast..... 386
Iron, The evaluation of foundry pig..... 323
Iron and steel, Types of corrosion of unprotected..... 110
Iron castings, Fillets for patterns for..... 97
Iron corrosion of buried specimens, Cast..... 119
Iron for casting purposes, Conference on the use of pig..... 328
Iron from cupolas, Causes of irregular temperatures of..... 277
Iron mixtures, Adding chromium to..... 371
Iron pipe, Corrosion of cast..... 101
Iron scrap in the blast furnace, Use of.....319, 323, 328
Iron temperature charts..... 276
Iron temperature recorder, Cupola spout arranged for..... 276
Iron tests, International test bar for..... 13
Iron to aluminum bronze alloy, Effect of adding..... 451

Labor turnover, Apprentice training important in reducing..... 61
Labor turnover in a foundry.....45, 47
Ledeburite in cast iron..... 388

Macrostructure of gray cast iron..... 387
Malleable castings, Fillets for patterns for..... 97
Malleable castings, Pickling solutions for cleaning..... 445
Malleable foundry, Synthetic molding sands in the..... 138
Malleable foundry costs..... 18
Malleable furnace refractories, Report of committee on..... 438
Malleable furnaces, Shapes of brick for..... 443
Malleable furnaces, Tap out blocks for..... 438
Malleablizing, Definition of..... 226
Manganese to aluminum bronze alloy, Effect of adding..... 452
Melting point of ferrochrome..... 374

Page

Metal trades association launches a new apprentice training campaign in Milwaukee 66
Moisture test of molding sand..... 181
Mold drying, Effects on molds and castings using steam heat for.... 226
Molding, sand, Effects of clay quality on..... 191
Molding sand, Moisture test of..... 181
Molding sand, Old core sand makes excellent base for synthetic..... 140
Molding sand, Refractoriness test of..... 181
Molding sand, Selection of proper clay important in making synthetic 141
Molding sand, Tensile test of..... 181
Molding sand control in reducing casting losses..... 251
Molding sand drying out too quickly, Use of glycerine prevents..... 141
Molding sand purposes, Treating core sands for..... 140
Molding sand quality, Grain distribution effect on..... 188
Molding sand research, Report of committee on..... 9
Molding sands, Different methods of ramming require different moisture contents of..... 170
Molding sands for pipe foundries, Comparison of dry and green strengths of 171
Molding sands in the malleable foundry, Synthetic..... 138
Molds to test chaplets and core irons..... 258

Nickel and chromium, Effects on cast iron of..... 370
Nickel in cast iron, Effects of chromium and..... 356
Nickel to aluminum bronze alloy, Effect of adding..... 451
Non-ferrous castings, Fillets for patterns for..... 97
Non-ferrous casting, Fluidity tests applied to..... 302
Normalizing, Definition of..... 226

Oil qualities, Chemical tests of core..... 150
Oil specifications, Core 148
Oven, A new type of mold drying..... 214
Overhead foundry costs..... 22
Oxidation of iron preceded by oxidation of graphite causing growth in cast iron..... 310
Oxygen in cast iron, Theory of..... 395

Pattern equipment standardization, Report of committee on..... 95
Pattern letters 96
Pattern match plate, Lug design for..... 99
Pattern plate thickness, Standards for..... 99
Patterns, Color ingredients of coating materials for marking..... 96
Patterns, Marking gaged surfaces and locating points on..... 96
Patterns, Markings indicating chilled surfaces and metal inserts on.. 96
Patterns and core boxes, Marking loose pieces for..... 97
Pearlite in cast iron..... 388
Pearlitic iron, Diefenthaler process of..... 408

Page
Permeability, Tests to determine effect of rammer support on..... 182
Permeability of molds, Report of committee on testing..... 180
Permeability of sands for a pipe foundry..... 172
Permeability test of molding sand..... 181
Phophorus and sulphur in steel, Report of investigation of effects of..4, 230
Phosphorus formations shown in cast iron..... 388
Pickling solutions for cleaning malleable castings..... 445
Pig iron, Blast furnace conditions in making..... 428
Pig iron, Charcoal 349
Pig iron, Resolution to provide for investigation of effect of use of scrap in the blast furnace on..... 348
Pig iron, The evaluation of foundry..... 323
Pig iron for casting purposes, Conference on the qualities of..... 328
Pig iron from blast furnace, Air used in producing.....333, 336
Pig iron qualities, Causes of variation in..... 427
Pig irons, Chemical versus fracture grading of..... 325
Pipe foundry, Sand test methods used in a..... 172
Pipes, Protective coatings for preventing corrosion of soil..... 105
Plumbago blacking 235
Primary graphite in cast iron..... 393
Protective coatings for preventing corrosion of soil pipes..... 105

Refractories, Cupola lining 266
Refractories, Report of committee on foundry..... 14
Refractories, Report of committee on malleable furnaces..... 438
Refractories, Slag corrosion of cupola..... 270
Refractories shapes for side walls and bridge walls of malleable furnaces 442
Refractoriness of steel molding and core materials..... 205
Refractoriness test of molding sand..... 181
Report of A.F.A. representative on joint committee on investigation of phosphorus and sulphur in steel.....4, 230
Report of A.F.A. representative on joint committee to consider placing of weights of castings on blue prints..... 15
Report of committee on apprentice training..... 6
Report of committee on corrosion of metals..... 5
Report of committee on foundry costs..... 10
Report of committee on foundry refractories..... 14
Report of committee on gray iron castings..... 11
Report of committee on heat treatment of ferrous metals.....13, 224
Report of committee on international relations..... 6
Report of committee on pattern equipment standardization..... 95
Report of committee on steel castings..... 16
Report of joint committee on foundry refractories..... 438
Report of joint committee on molding sand research..... 9
Report of joint committee on pattern equipment standardization..... 3

Page

Report of sub-committee on conservation and reclamation of foundry sands 198
Report of sub-committee on core testing..... 179
Report of sub-committee on grading foundry sands..... 187
Report of sub-committee on malleable furnace refractories..... 438
Report of sub-committee on shear test for molding sand..... 180
Report of sub-committee on testing permeability of molds..... 180
Report of sub-committee on tests of foundry sands..... 179
Report of technical committees presented at annual business meeting.. 1
Resolution to provide for investigation of effect of use of scrap in the blast furnace..... 348

Sand, Colloids in molding..... 191
Sand, Effects of clay quality on molding..... 191
Sand, Method for calculating grain fineness of foundry..... 190
Sand, Moisture test of molding..... 181
Sand, Permeability test of molding..... 181
Sand, Refractoriness test of foundry..... 181
Sand, Selection of proper clay important in making synthetic molding. 141
Sand, Shear test for foundry..... 180
Sand, Tensile test of molding..... 181
Sand, Waste in foundry by discarding..... 139
Sand control in the pipe foundry, Routine..... 170
Sand control in reducing casting losses, Molding..... 251
Sand drying out too quickly, Use of glycerine to prevent molding.... 141
Sand in the malleable foundry, Synthetic molding..... 138
Sand molds, Report of committee on testing permeability of..... 180
Sand on fluidity of iron, Effect of moisture in..... 294
Sand permeability specimens, Effects of ramming..... 185
Sand quality, Grain distribution effect on foundry..... 188
Sand research, Report of committee on..... 9
Sand test methods used in a pipe foundry..... 172
Sands, Calculations showing grain fineness number of foundry..... 196
Sands, Example showing calculations to obtain grain fineness number, grain fineness classification and clay content classification of foundry 196
Sands, Report of committee on conservation and reclamation of foundry 198
Sands, Report of committee on grading foundry..... 187
Sands, Report of sub-committee on tests of foundry..... 179
Sands, Tentative standard grading classifications for foundry..... 193
Sands for synthetic molding sand purposes, Treating core..... 140
Seven years of foundry cost accounting..... 32
Shear test for molding sand, Report of sub-committee on..... 180
Silicon and chromium in cast iron.....364, 366
Silicon in cast iron.. 388

Page
Silicon on growth of cast iron, Effects of 310
Slag corrosion of cupola refractories 270
Soil corrosion investigation, Bureau of Standards 101
Soil, pipes, Protective coatings for preventing corrosion of 105
Spalling of cupola refractories 268
Spheroidizing, Definition of 226
Standard sizes of core prints for metal patterns 98
Standards, Report of committee on pattern equipment 95
Standards for lugs for pattern plates 100
Standards for pattern plate thickness 99
Standards for vibrators used in connection with pattern plates 99
Steam heat use in drying molds for steel castings 217
Steel, Report of A. F. A. representative on committee on investigation of phosphorus and sulphur in 4, 230
Steel and iron, Types of corrosion of unprotected 110
Steel castings, Fillets for patterns for 97
Steel castings, Report of committee on 16
Steel castings, Steam heat use in drying molds for 217
Steel foundry costs 18
Steel molding, Cores for 212
Steel molding and core making, High temperature materials for 209
Steel molding and core materials, Refractoriness of 205
Steel molding and core sand materials, Characteristics of some 202
Steel molding materials, Cost figures for 207
Steel scrap in the blast furnace 320
Sulphur in steel, Report of investigation of effects of phosphorus and 4, 230
Synthetic molding sand, Selection of proper clay important in making. 141
Synthetic molding sand in the malleable foundry 138

Tap out blocks for malleable furnaces, Sizes of 438
Technical committees' reports presented at annual business meeting... 1
Temperature for baking core sand mixtures 159
Tempering, Definition of 226
Tensile test of molding sand 181
Testing equipment for core sand tests 161
Testing machine to determine qualities of graphite and amorphous carbon blackings 240
Testing permeability of molds, Report of sub-committee on 180
Tests of graphite blacking 236

Uniform cost system for a local cost group 20
Upgrading of foundry apprentices 79

Vibrator standards for use in connection with match plates 99
Vocational guidance and apprentice training 58

Waste in foundry by discarding old sand 139

Author's Index

Page

Anderson, D. G., with Ogden, A. N., Foundry Blacking..... 235
Andrew, J. H., The Growth of Cast Iron..... 307

Bolton, J. W., Some Graphite Formations in Gray Cast Iron..... 386

Campbell, H. L., Effects of Moisture Absorption on the Properties of Dry Sand Cores..... 158
Carter, J. L., A Uniform Cost System for a Local Group..... 20
Connelley, C. B., Apprentice Training Situation in the Pittsburgh District 71
Crosby, V. A., Core Oil Specifications..... 148
Curry, C., Test Bars to Establish the Fluidity Qualities of Cast Iron. 289

Dietert, H. W., Correction of Cupola Operation by Means of Cupola Temperature Recorder..... 275

Freund, C. J., Metal Trades Association Launches a New Campaign in Milwaukee..... 66

Greene, R. A., The Reduction of Molding Losses..... 458
Gregg, A. W., Apprenticeship as a Labor Stabilizer..... 45

Haley, J. M., Analysis of Four Hundred Tons of Defective Castings. 247

Jansen, H., Co-operation First Essential Towards Success in Apprenticeship 75

Kuniansky, M., Routine Sand Control in the Pipe Foundry..... 170

Logan, K. H., Bureau of Standards Soil Corrosion Investigation... 101
Lyon, S. W., with Moore, H. F., Fatigue Tests of Cast Iron..... 410

McCaffery, R. S., The Cause of Variations in Pig Iron Qualities.. 427
McDaniels, D., Group Foundry Costs..... 38
McLain, D., An Expression of Views on the Use of Iron Scrap in the Blast Furnace..... 319
Moldenke, R., The Evaluation of Foundry Pig Iron..... 323
Moore, H. F., with Lyon, S. W., Fatigue Tests of Cast Iron..... 410

Ogden, A. N., with Anderson, D. G., Foundry Blacking..... 235

Perry, W. B., Making Apprenticeship Pay Dividends..... 51
Poister, R. S., The Effects of Chromium and Nicket in Cast Iron.... 356

Reader, R. C., The Improvement of Aluminum Bronze as an Engineering Material..... 449
Roesch, H. J., A Publicity Program Justified by Correct Training Methods to Attract Young Men..... 56
Ross, C. H., Upgrading of Foundry Apprentices..... 79

Page

Sampson, J. M., with Wright, G. H., A New Type of Mold Drying Oven 214
Schaller, G. S., A Study of Cupola Lining Refractories..... 266
Scheiber, F. C., Synthetic Molding Sands in the Malleable Foundry.. 138

Varlet, J., Cast Chaplets and Tinned and Untinned Core Irons..... 256

Watson, W., Careful Selection and Supervision are Important in Reducing Apprentice Turnover..... 61
Wessling, A., Seven Years of Foundry Cost Accounting..... 32
Wolf, F. L., Pickling Solutions for Cleaning Castings..... 445
Wright, G. H., with Sampson, J. M., A New Type of Mold Drying Oven 214

Young, E. R., Characteristics of Some Steel Molding and Core Sand Materials 202